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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/759,786	01/15/2004	Peter Chambers	MIC-M096	8161
32566	7590	06/20/2007		
PATENT LAW GROUP LLP 2635 NORTH FIRST STREET SUITE 223 SAN JOSE, CA 95134			EXAMINER DO, CHAT C	
			ART UNIT 2193	PAPER NUMBER
			MAIL DATE 06/20/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/759,786	CHAMBERS ET AL.	
	Examiner	Art Unit	
	Chat C. Do	2193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This communication is responsive to Amendment filed 04/26/2007.
2. Claims 1-21 are pending in this application. Claims 1 and 13 are independent claims. In Amendment, claims 1, 7, 10, 13, and 21 are amended. This Office Action is made final.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 1-21 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-21 disclose a method for performing a mathematical conversion of an input value to another output value wherein they are related as expressed equation. In order for claims to be statutory, claims must either include a practical/physical application or a concrete, useful, and tangible result. However, claims 1-21 merely disclose steps of performing mathematical conversion in hardware without expressly disclosing a practical application or a tangible result since the claims appear to preempt every substantial practical application of the idea embodied by the claim and there is nothing that breathes sufficient life and meaning into the preamble so as to limit it to a particular practical application rather than being so broad and sweeping as to cover every

substantial practical application of the idea embodied therein. Therefore, claims 1-21 are directed to non-statutory subject matter.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-5, 7-10, 13, and 15-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Kelly (U.S. 5,942,992).

Re claim 1, Kelly discloses in Figures 1-7 a device for performing numerical value conversion of an N-bit digital input value in a first unit to a second unit being a natural unit, the first unit being related to the second unit by a first equation (e.g. abstract and Figures 2 wherein the first unit is output of A/D converter 202 and the second unit is the engineering units 299), comprising: a memory having stored thereon a look-up table (e.g. memory table 214 in Figure 2A) storing a plurality of coefficients (e.g. plurality coefficients A 216 and B 224 set in the memory 214 in Figure 2A) for performing the numerical value conversion from the first unit to the second unit (e.g. output of the adder 226 in Figure 2A), the look-up table being indexed using a first parameter to provide a selected coefficient (e.g. index by addressing to specific coefficient corresponding to the addresses of the sequencer 210 and 212 in Figure 2A); and an arithmetic logic unit (e.g.

all components 206, 220, and 226 in Figure 2A or all components in 507 in Figure 5 comprising splitter, multiplier, and adder) receiving the N-bit digital input value (e.g. digital value 204 in Figure 2A) in the first unit and the selected coefficient from the look-up table (e.g. output 205B and coefficients A and B from the table in Figure 2A), the arithmetic logic unit (e.g. all components 206, 220, and 226 in Figure 2A or all components in 507 in Figure 5 comprising splitter, multiplier, and adder) performing the numerical value conversion based on the first equation and using the selected coefficient to compute a digital output value in the second unit (e.g. expression in 108 and 110 in Figure 1).

Re claim 2, Kelly further discloses in Figures 1-7 the first unit comprises an arbitrary unit and the second unit comprises a natural unit of physical measurement (e.g. abstract wherein the first unit is measured unit value and the second unit is the engineering value).

Re claim 3, Kelly further discloses in Figures 1-7 the numerical value conversion from the arbitrary unit to the natural unit has a linear relationship described by the equation $D_{sub.N} = m D_{sub.A} + c$ (e.g. this expression is seen in Figures 1 and 2A wherein O as output of adder 226 $= A * X + B$), where $D_{sub.A}$ is the digital input value, $D_{sub.N}$ is the digital output value, m is a slope coefficient and c is an offset coefficient, and the plurality of coefficients comprises a plurality of coefficient pairs, each coefficient pair comprising a slope coefficient and an offset coefficient (e.g. Figures 2A and 2B wherein coefficient A is the slope coefficient and coefficient B is the offset coefficient as seen in Figure 2A).

Re claim 4, Kelly further discloses in Figures 1-7 the numerical value conversion from the arbitrary unit to the natural unit has a non-linear relationship and the plurality of coefficients implements the numerical value conversion in a piecewise-linear fashion approximating the non-linear relationship (e.g. col. 1 lines 30-35 and col. 5 lines 32-39).

Re claim 5, Kelly further discloses in Figures 1-7 the look-up table stores the plurality of coefficients for a plurality of linear segments for performing the piecewise-linear numerical value conversion, each linear segment being described by the equation $D_{sub.N} = m D_{sub.A} + c$ (e.g. this expression is seen in Figures 1 and 2A wherein O as output of adder 226 = $A * X + B$), where $D_{sub.A}$ is the digital input value, $D_{sub.N}$ is the digital output value, m is a slope coefficient and c is an offset coefficient for the respective linear segment, and the plurality of coefficients comprises a plurality of coefficient pairs, each coefficient pair comprising a slope coefficient and an offset coefficient for the respective linear segment (e.g. table 214 in Figure 2A and col. 5 lines 30-68 and coefficient A is the slope coefficient and coefficient B is the offset coefficient as seen in Figure 2A).

Re claim 7, Kelly further discloses in Figures 1-7 digital input value comprises a digitized value in an arbitrary unit generated by an analog-to-digital converter (e.g. component 202 in Figure 2A) and the second unit comprises a natural unit of physical measurement (e.g. component 100 in Figure 2A, abstract and Figure 1 with steps 102 and 112).

Re claim 8, Kelly further discloses in Figures 1-7 the first parameter comprises a system operating condition associated with a system providing the digital input value

(e.g. abstract and the last six lines of abstract as related to temperature, col. 2 lines 10-33, and Figure 6 wherein the condition is the temperature condition).

Re claim 9, Kelly further discloses in Figures 1-7 the first parameter comprises an operating temperature associated with the system providing the digital input value (e.g. Figure 6) and wherein each coefficient in the look-up table corresponds to an assigned range of the operating temperature (e.g. abstract, table 214 in Figures 2A-2B and the last six lines of abstract as related to temperature).

Re claim 10, Kelly further discloses in Figures 1-7 the first parameter comprises the most significant k bits of the digital input value where k is less than N (e.g. high order bits 208 in Figure 2A).

Re claim 13, it is a method claim of claim 1. Thus, claim 13 is also rejected under the same rationale as cited in the rejection of rejected claim 1.

Re claim 15, it is a method claim of claim 2. Thus, claim 15 is also rejected under the same rationale as cited in the rejection of rejected claim 2.

Re claim 16, it is a method claim of claim 3. Thus, claim 16 is also rejected under the same rationale as cited in the rejection of rejected claim 3.

Re claim 17, it is a method claim of claim 4. Thus, claim 17 is also rejected under the same rationale as cited in the rejection of rejected claim 4.

Re claim 18, it is a method claim of claim 5. Thus, claim 18 is also rejected under the same rationale as cited in the rejection of rejected claim 5.

Re claim 19, it is a method claim of claim 8. Thus, claim 19 is also rejected under the same rationale as cited in the rejection of rejected claim 8.

Re claim 20, it is a method claim of claim 9. Thus, claim 20 is also rejected under the same rationale as cited in the rejection of rejected claim 9.

Re claim 21, it is a method claim of claim 10. Thus, claim 21 is also rejected under the same rationale as cited in the rejection of rejected claim 10.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kelly (U.S. 5,942,992).

Re claim 6, Kelly does not disclose in Figures 1-7 the non-linear relationship comprises a logarithmic relationship. However, Kelly does mention that the conversion is performed either linear or nonlinear in related to engineering conversion (e.g. abstract and col. 1). Further, the examiner takes an official notice that the logarithm conversion is well-known in the technology of art and widely used in engineering system. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to add a logarithm relationship for conversion because it would enable to simplify the analysis by converting into logarithmic unit (e.g. col. 1 in order for a user to analyze value and meaningful data from measurement).

Re claim 11, Kelly further discloses in Figures 1-7 digital input value comprises a digitized voltage value in an arbitrary unit generated by an analog-to-digital converter (e.g. step 102 in Figure 1). Kelly fails to disclose the second unit comprises a Decibel unit. However, Kelly does mention that the conversion is performed either linear or nonlinear in related to engineering conversion (e.g. abstract and col. 1). Further, the examiner takes an official notice that the Decibel unit is well-known in the technology of art and widely used in engineering system for many practical application. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to add a Decibel unit because it would enable to convert value into engineer practical unit for simplify the analysis (e.g. col. 1 in order for a user to analyze value and meaningful data from measurement).

Response to Arguments

9. Applicant's arguments filed 04/26/2007 have been fully considered but they are not persuasive.
 - a. The applicant argues in pages 10-13 for claims 1-21 rejected under 35 U.S.C. 101 that the claim 1 recites a practical application in analog-to-digital conversion system; claim 1 recites a useful, concrete, and tangible result since it performs a numerical value conversion to generate digital output values that are expressed as real-world parameters see paragraph [0025] wherein the digital output value is a digital value expressed in units of physical measurement such as degree centigrade, volts, ampere, decibels, and watts; and further claim 1 does not cover every substantial practical application of the

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mathematical function since it is directed to one specific and practical application of the mathematical function for performing numerical value conversion from an arbitrary unit to a natural unit.

The examiner respectfully submits that the current claimed invention is structured similarly to Benson (USPQ, 1st Series (1929 - 1986) > U.S. Supreme Court > GOTTSCHALK, Comr. Pats. v. BENSON et al., 175 USPQ 673 (U.S. 1972)) which is directed to non-statutory subject matter. The claims 1-21 merely disclose a device/method for converting unit from one dimension to another dimension of unit without explicitly define/disclose the practical application or useful and tangible result of the final result of conversion. Without the practical application or useful and tangible result of the final result of conversion, the claims appear to preempt every substantial practical application of the idea embodied by the claim and there is nothing in claims that breathes sufficient life and meaning into the preamble so as to limit it to a particular practical application rather than being so broad and sweeping as to cover every substantial practical application of the idea embodied therein. The A/D converter is just a initial component of structure for performing conversion. It's not practical application in A/D conversion system. Further, claim 1 does not specific any practical application as alleged by the applicant which leads to preempt the use of the conversion function.

b. The applicant argues in page 14 for claim 1 that the cited reference by Kelly fails to disclose the features "the look-up table being indexed using a first parameter" and the

“arithmetic logic unit receiving the N-bit digital input value” as cited in the claimed invention.

The examiner respectfully submits that claim 1 does not specifically or explicitly define how the first parameter is used to index the look-up table. Using an input parameter to address a stored coefficient in the look-up table is also considered as one way of indexing the look-up table for stored coefficient as clearly seen in the cited reference by Kelly. Further, the claim does not specifically or explicitly define what is including or what is excluded from the arithmetic logic unit. Thus, the examiner consider the arithmetic logic unit comprising: the splitter, multiplier, and adder as seen in component 507 in Figure 5 for receiving the full N-bit digital input value 204 as cited by the applicant.

c. The applicant argues in page 15 first paragraph for claims 8-9 that the cited reference by Kelly fails to disclose the system operating temperature associated with a system providing the digital input value since Kelly does not teach or suggest using an operating condition or an operating temperature as the address to the coefficient table as cited in the claimed invention.

The examiner respectfully submits that Figure 6 of the cited reference by Kelly clearly disclose the operating temperature is measured and fed directly to engineering converter system 701 for converting to temperature unit as seen in any conversion system in Figures 2-5 and 7. Wherein in any of those system, the

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first few bits are used to index by addressing the memory 214 for stored coefficient to perform unit conversion as clearly seen in Figures 2A and 5.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chat C. Do whose telephone number is (571) 272-3721. The examiner can normally be reached on M => F from 7:00 AM to 5:30 PM.

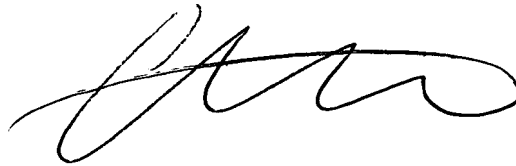
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chat C. Do
Examiner
Art Unit 2193

June 12, 2007

A handwritten signature in black ink, appearing to be 'Chat C. Do', written in a cursive style.